U.S. DEPARTMENT OF COMMERCE
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PB-253 026-T

AN EXPERIMENTAL STUDY ON REPEATED EXPOSURE TO NITROGEN DIOXIDE

ENVIRONMENTAL PROTECTION AGENCY

1969

148241

PB 253 026-T

EPA-TR-438-74

APTIC 21870

NO_2 hanpuku bakuro no jikkenteki kentō

[AN EXPERIMENTAL STUDY ON REPEATED EXPOSURE TO NITROGEN DIOXIDE]

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A. Tanizaki

Taiki osen kenkyu (Journal of Japan Society of Air Pollution), Vol. 4, No. 1, 1969

Translated for EPA by
SCITRAN (SCIENTIFIC TRANSLATION SERVICE)
SANTA BARBARA, CALIFORNIA

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NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

(5)

BIBLIOGRAPHIC DATA SHEET	1. Report No. EPA TR74-438	2.	3. Recipient's Accession No.
4. Title and Subtitle An Experimental Study on Repeated Exposure to Nitrogen Dioxide			5. Report Date 1969 6.
7. Author(s) M. Yamage, K. Oomori, N. Nakamura and A. Tanizaki			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Translated from the Japanese by EPA			10. Project/Task/Work Unit No. 11. Contract/Grant No.
12. Sponsoring Organization Name and Address EPA ISD Translation Services Division Library RTP, NC 27711			13. Type of Report & Period Covered 14.

15. Supplementary Notes
Taiki osen kenkyu (Journal of Japan Society of Air Pollution) 4(1): pages unknown 1969

16. Abstracts

17. Key Words and Document Analysis. 17a. Descriptors
Nitrogen dioxide
Toxicology
EPA ISD

17b. Identifiers/Open-Ended Terms
Low concentration nitrogen dioxide
Biochemical experimentation
Toxicology

17c. COSATI Field/Group 06-T

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
Exclusive permission granted to NTIS for the storage and distribution of this material	UNCLASSIFIED	3
	20. Security Class (This Page) UNCLASSIFIED	22. Price 3.50

123. AN EXPERIMENTAL STUDY ON REPEATED EXPOSURE TO NITROGEN DIOXIDE

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There have so far been many reports on the effects of atmospheric pollutants such as NO_2 and O_3 on functions of the lung, including reports on the histamine content of lung tissues. As far as animal experiments are concerned, many of the reports deal with effects of relatively high concentrations. On this occasion, we examined the dynamic properties of histamine inside the lungs and other organs through repeated exposures to NO_2 of relatively low concentrations over a long period, and also attempted sthenometric measurements by means of the natation method. We will report on the findings.

Guinea pigs and mice were used as experimental animals. The guinea pigs were exposed continuously to concentrations of 1 ppm and 5 ppm, and the mice to a concentration of 1 ppm only, both for 3 hours a day and 5 days a week. The progress was observed for about 2 months, during which period 5 animals from each group were killed at appropriate intervals, and the histamine content of lungs and

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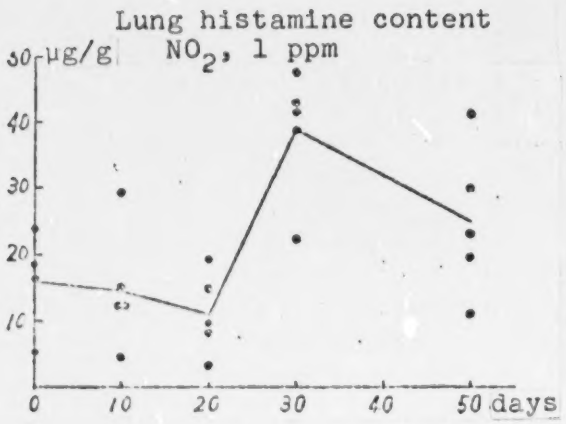

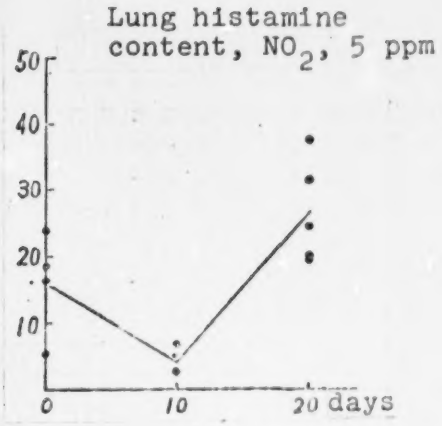

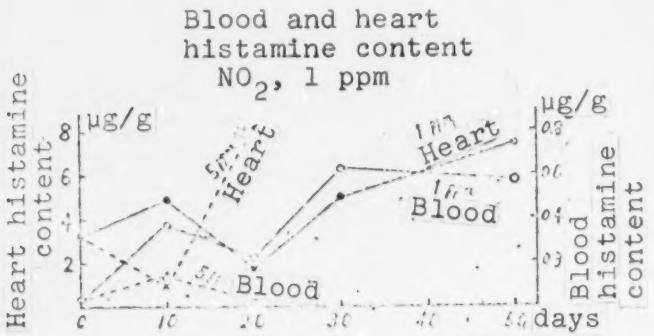

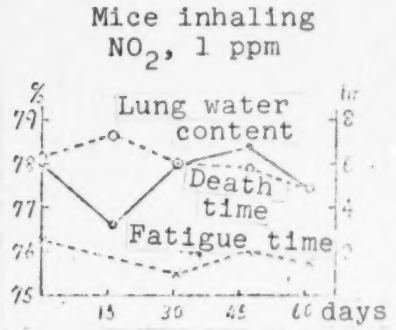

other tissues were examined. The histamine content was measured by means of the fluorescent photometry method of P. A. Shore et al. The lung water content was calculated on the basis of moisture loss after a drying period of 24 hours at 110° C. The sthenometric tests were conducted by letting the animals swim about freely in water at 25° C. The moment at which they started treading water was recorded as the fatigue time. They were thereafter left until they died, and the time which elapsed was also measured.

The experimental results are shown in the figures above. With the lung histamine content, some increase was observed in the 5 ppm group on the 20th day, while an increase was detected in the 1 ppm group on the 30th day. The histamine content of the blood was in ultra-micro quantities, but a gradually increasing tendency was indicated in the 1 ppm group, while no change was observed in the 5 ppm group.

In the examination of the mice, changes accompanying the progress in the exposure to NO_2 were not observed in terms of the lung water content, but in the sthenometric tests certain reductions in the fatigue time and death time were observed. In the future, we are planning to examine further the effects of low concentration gases, as well as to study the interactions and other characteristics of irritating gases.